

RESEARCH ON MONEY AND FINANCE

Discussion Paper no 15

"New Forms of External Vulnerability: Brazil in the Global Financial Crisis"

Annina Kaltenbrunner

Juan Pablo Paineira

Department of Economics, School of Oriental and African Studies

December 2009

Research on Money and Finance Discussion Papers

RMF invites discussion papers that may be in political economy, heterodox economics, and economic sociology. We welcome theoretical and empirical analysis without preference for particular topics. Our aim is to accumulate a body of work that provides insight into the development of contemporary capitalism. We also welcome literature reviews and critical analyses of mainstream economics provided they have a bearing on economic and social development.

Submissions are refereed by a panel of three. Publication in the RMF series does not preclude submission to journals. However, authors are encouraged independently to check journal policy.

Annina Kaltenbrunner, Email: ak82@soas.ac.uk. **Juan Pablo Paineira**, Email: jppaineira@soas.ac.uk. The authors would like to thank to the discussants of the SOAS International Workshop on 'Transmission mechanisms of the global financial crisis on the developing world: the commodity and financial market linkages' in London in July 2009, and to the participants of the 2009 Conference of the Development Studies Association, 'Current Crisis and New Opportunities', University of Ulster, United Kingdom in September 2009. All remaining errors are our responsibility.

Research on Money and Finance is a network of political economists that have a track record in researching money and finance. It aims to generate analytical work on the development of the monetary and the financial system in recent years. A further aim is to produce synthetic work on the transformation of the capitalist economy, the rise of financialisation and the resulting intensification of crises. RMF carries research on both developed and developing countries and welcomes contributions that draw on all currents of political economy.

Research on Money and Finance
Department of Economics, SOAS
Thornhaugh Street, Russell Square
London, WC1H 0XG
Britain

www.soas.ac.uk/rmf

Abstract

This paper argues that Brazil has become subject to new forms of external vulnerability, which led to one of the largest exchange rate depreciations among emerging markets in the recent global financial crisis. Going beyond traditional external vulnerabilities in the form of creditor-debtor relations and stressing the dialectic relationship between capital flows and domestic financial conditions, it is argued that any exposure to (short-term) foreign investment creates vulnerabilities in the domestic economy, making price dynamics increasingly dependent on conditions in international financial markets. In the case of Brazil this vulnerability manifested itself particularly in a rising share of foreign participation in the domestic stock and derivative markets. The rising liquidity of the Brazilian financial system, characterised by a very short-term nature of financial assets and the willingness of the central bank to provide liquidity to the market at any time, fuelled the share of foreign investment in Brazilian assets. The large stock of accumulated foreign investment in Brazilian assets and the liquidity with which these were traded significantly exacerbated exchange rate volatility in the crisis, as – despite sound fundamentals - the country's assets were among the first and with the largest volume to be sold. It is further shown that Brazil's rising external vulnerability was not unrelated to domestic economic conditions. Through its operations in the foreign exchange market and providing liquidity to the market - both before and during the crisis - the central bank significantly contributed to Brazil's increased vulnerability to international market conditions.

Introduction

This paper examines the effects of the global financial crisis on developing countries by considering the effects of international capital flows on their economies. The analytical focus lies on the role of financial markets and their interaction with the central bank in the transmission mechanism. Using the example of Brazil, the paper attempts to highlight the risks of increased integration in international financial markets as even fundamentally sound countries experience large movements in domestic asset prices, especially exchange rates, as a result of portfolio adjustments of international and domestic investors. As such this paper argues that Brazil has become subject to a new form of external vulnerability caused by the large stock and short-term nature of foreign investment in Brazilian assets, which in turn led to one of the largest exchange rate depreciations among developing and emerging countries during the global financial crisis.

The role of external vulnerabilities for determining exchange rate dynamics in the moment of crisis has been intensively discussed in economic literature after the emerging market crisis of the 1990s, especially with reference to the East Asian economies. In these “third-generation models”, based on the asymmetric information approach, creditor relations and creditors` concerns about a country`s repayment capacity assume a crucial role for exchange rate dynamics. For example Radelet et al. (1998) present a model, in which possible debtor illiquidity and a coordination failure among creditors leads to a run on the currency. They point to the important distinction between illiquidity and insolvency and the intrinsic instability in international lending (pp. 6). In a similar vein Rodrik and Velasco (1999: 1) write: “Almost all of the countries affected by the financial turmoil of the last few years had one thing in common: large ratios of short-term foreign debt, whether public or private, to international reserves... in each case, the combination of large short-term liabilities and relatively scarce international liquid assets resulted in extreme vulnerability to a confidence crisis and a reversal in capital flows”. They build a model where the existence of liquid liabilities and illiquid assets create the potential for self-fulfilling creditor runs. A very similar approach is taken by Chang and Velasco (1998), who apply Diamond and Dybvig`s (1983) famous model on self-fulfilling bank runs to an open economy context.

However, while acknowledging the role of external vulnerabilities for the behaviour of capital flows and thus exchange rates, this paper argues that above literature has two main shortcomings: First, it does not take into account that it is the capital flows themselves, which create debtor-creditor relations and thus the external vulnerabilities. Thus one has to understand the reciprocal relationship between capital flows and external vulnerabilities: it is the capital flows themselves which create the conditions in the domestic financial system which in turn shape the dynamics of their own behaviour. In other words, the exposure to international capital flows creates vulnerabilities in the domestic financial systems which then determine the behaviour of capital flows themselves¹.

Second, above outlined mainstream economic literature only focuses on the role of external debt for a country`s external vulnerability. This paper, however, argues that any exposure in domestic assets funded by external borrowing will create vulnerabilities which are not directly related to the traditional forms of external vulnerabilities, but result from the immediate currency exposure of cross-country investment. In the presence of a large stock of foreign investment in the country any change in international market conditions and thus the need for foreign investors to change their portfolio allocations might lead to a sell-off of domestic

¹ This dialectic relationship of capital flows has been analysed in the context of public and private domestic currency mismatches in debt relations by Paineira and Carcanholo (2004).

assets, which can be entirely unrelated to domestic economic conditions. As a result, as the presence of foreign investors increases in the economy, the dynamics of domestic financial markets become increasingly determined by conditions on international financial markets.

However, the argument is more complex than that: capital flows and thus the dynamics of the domestic financial system do not become completely de-linked from domestic financial conditions. In line with the dialectic relationship of capital flows outlined above, not only do capital flows create a new form of external vulnerability in the form of a large stock of foreign capital in the economy, this stock itself will determine the behaviour of capital flows. As the presence of foreign investors in the domestic financial markets becomes larger and larger the risk of sudden capital outflow increases as international investors become weary about their exposure to this asset class. Thus, capital flows create the conditions in the domestic financial system, which determine their own behaviour.

The new form of external vulnerability described in this paper can manifest itself on different markets and will depend on the specific structure of the domestic financial system and its integration in international financial markets. In the Brazilian case, exposure to a large stock of foreign investment on the stock and derivative market were its most obvious manifestations.

Finally this paper also shows that Brazil's increased external vulnerability through the presence of a large stock of foreign investment in the economy is related to domestic conditions. As such it argues that the increased liquidity of Brazilian financial assets has fuelled and supported the foreign participation. This liquidity has been provided first by an increasingly short-term nature of financial applications in the Brazilian economy and second by the commitment of the central bank to act as main provider of liquidity in the interface between international capital flows and the domestic financial system. Thus it is argued that central banks have been key players in the implementation and spread of financial integration of developing countries, which is established through highlighting the interaction between the political economy of central banks and financial system during the unfolding of the global financial crisis in the Brazilian economy. Attention is paid to the relation between international capital flows and domestic public management, and their connection with the financial derivatives market, focusing on central bank intervention and the dynamic of banking system, mainly in the futures market².

In line with Minsky's writings this paper defines liquidity as the ability to meet outstanding obligations. Minsky's definition is based on Keynes' concept of liquidity, which he essentially put forward in his *General Theory*³. Keynes defines liquidity as the ability to convert any capital asset into money, both in terms of its value preservation and time conversion. Thus liquidity has a temporal and wealth dimension at the same time. As money is *per se* the most liquidity capital asset, this creates a degree of liquidity among capital assets (called liquidity preference), which defines capital assets pricing or the portfolio allocation.

According to Minsky, however, capital asset pricing and portfolio decision theories should take into account the liabilities positions of economic units, which are interrelated with their assets positions as "...a portfolio decision has two interdependent facets. The first relates to

² In a sense, stressing the increased role of financial consideration in determining economic phenomena, in this case exchange rate dynamics, this paper is linked to the emerging literature on financialisation (e.g. Epstein, 2005, Lapavitsas, 2009 and Stockhammer, 2004) and attempts to extend this thinking on developing and emerging markets.

³ See Keynes (1964: chapter 17), where the author develops a theory of capital allocation decision.

what assets are to be held, controlled, or acquired; the second relates to how the position in these assets – i.e., their ownership or control – is to be financed” (Minsky, 1975: 70). The introduction of the liabilities structure in the analysis of liquidity is fundamental, as the issuance of liabilities can show the level of risk taken by the economic units in their portfolio decisions. In the international context this risk is influenced by two factors: first, the automatic exchange rate exposure which arises from domestic investment financed in international financial markets and second, the ability to convert domestic assets into foreign currency. Both risks have been mitigated by the short-term nature of Brazilian financial assets and the operations of the central bank as the main provider of liquidity. The ability to quickly divest themselves of Brazilian assets and reconvert them into US\$ has made Brazilian assets a standard part of international investors’ portfolio which led to the above outlined external vulnerability.

In addition while the use of Keynes’ concept of liquidity cannot entirely explain the demand for dollars in the crisis moment, Minsky’s emphasis on the liability side can account for the large depreciation of the real against the US dollar, which is the main funding currency in international financial relations and thus the denominator of most external obligations. As a result, as international financial conditions turned, the large stock of foreign participation in Brazilian assets funded in US dollar and the liquidity with which these assets were traded led to one of the largest exchange rate depreciations among emerging markets.

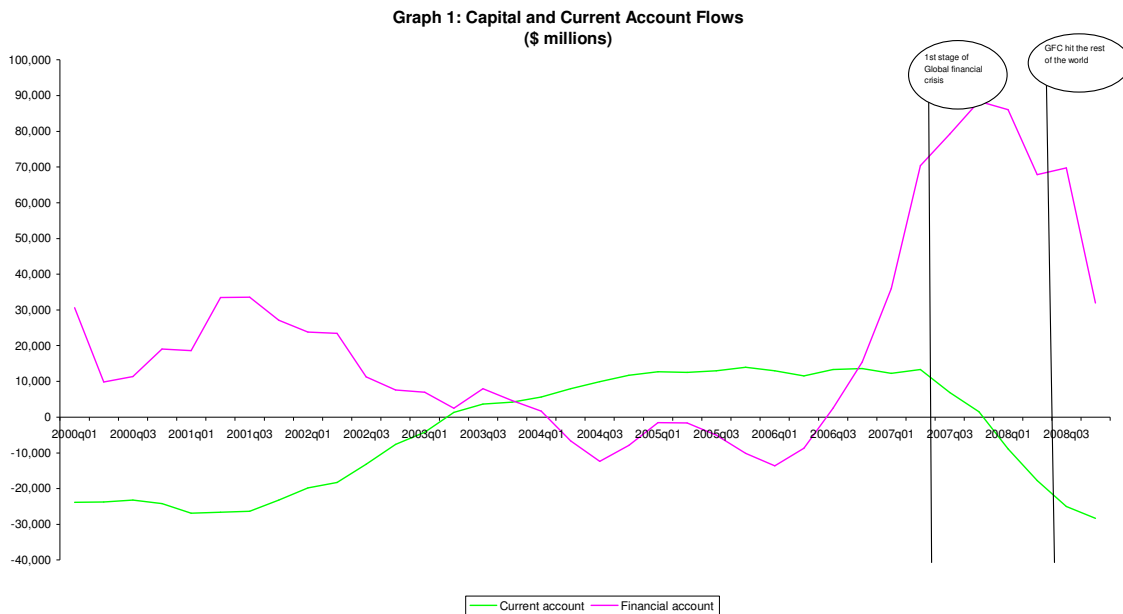
The new form of external vulnerability discussed in this paper, however, has important implications for macroeconomic and especially exchange rate management. If domestic asset prices, and especially the exchange rate, become increasingly determined by international portfolio considerations and de-linked from traditional economic fundamentals, the policy space of domestic authorities is severely limited. In this view, maintaining sound economic fundamentals - such as a healthy banking system or a huge stock of foreign exchange reserves - will not protect a country from the vagaries of international financial markets. In addition, the new form of external vulnerability discussed in this paper substantially increases the complexity of the relationship between capital flows and macroeconomic management. Although officially following an inflation targeting regime the Brazilian central bank has been intervening consistently in the foreign exchange market to prevent a too rapid appreciation of the real. It was, however, exactly this intervention which provided the liquidity to the market and stood as a support to the build up of Brazil’s external vulnerability. Thus, not only have exchange rate dynamics become mainly determined in international financial markets, any attempt by the central bank to control these movements have become severely limited in the face of Brazil’s increased financial integration.

The paper is divided into five sections. Section 1 analyses the interesting dynamics of capital flows and asset prices in Brazil slightly before and during the first stage of the global financial crisis. Section 2 highlights the different manifestations of the new form of external vulnerability which these capital flows created in the Brazilian economy. Section 3 then analyses how this vulnerability led to one of the highest exchange rate depreciations among emerging markets as the global financial crisis hit Brazil. Finally, section 4 shows how the operations of the central bank have been a crucial factor in shaping and supporting the dynamics of capital flows and resulting vulnerability before and after the crisis. Section 5 concludes the paper.

1- International capital flows and reserve accumulation: the nature of capital flows

This section discusses the behaviour and logic of capital flows in the Brazilian economy at three different stages of the international financial crisis: the immediate pre-crisis period before it openly burst in August 2007 in US housing markets, the first stage of the international financial crisis between August 2007 and September 2008 when it unfolded in developed financial markets and finally the second stage of the crisis in September 2008 as it also hit the developing and emerging world. The analysis will primarily focus on the dynamics of portfolio and other investments' capital flows as these flows are closely related to central bank actions and financial system dynamics⁴.

Graph 1 shows the behaviour of the Brazilian financial and current account from the beginning of 2000 until the collapse of Lehman Brothers and the peak of the international financial crisis in the third quarter of 2008: while the current account was positive between the first quarter of 2003 and the first quarter of 2008, net financial flows became negative in 2003 and then picked up sharply at the end of 2006.



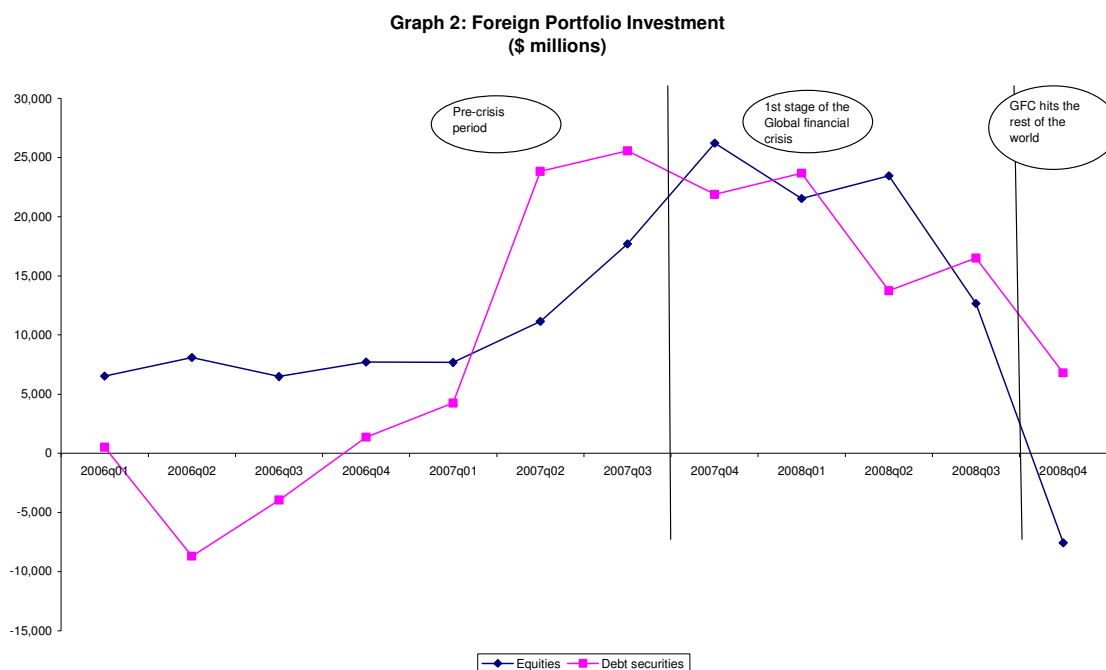
Source: BCB 2009.

While the positive financial flows at the beginning of the decade were mainly due to strong foreign direct investment inflows, the surge at the end of 2006 was primarily driven by short-term capital flows. Although partly shaped by the end of Brazil's agreement with the IMF in 2005, which had generated strong capital outflows in the form of repayments over previous

⁴ Although not subject of this paper it is important to mention that the speculative logic has expanded to other sectors of the Brazilian economy, which are not directly related to financial sector operations. Foreign direct investment is one of them: in the beginning of the global crisis the stock of intercompany loans to Brazil increased from US\$42 bn to US\$62 bn. At the same, while accumulated foreign direct investment increased from US\$35 bn to US\$37 bn, accumulated profits and dividends coming from prior direct investment showed a huge increase from US\$15 bn to \$26 bn. Thus foreign capital entered the country through inter-company loans, while the returns generated in the Brazilian economy were transferred abroad through the income account.

years, this dynamic reflects the logic of capital flows to emerging countries during the different stages of the international financial crisis.

Graph 2 gives a more detailed picture of the behaviour of net portfolio flows between the beginning of 2006 and the final quarter of 2008⁵. While remaining relatively stable over most of 2006, both stock market and fixed income investment experienced a substantial surge at the end of 2006. This surge coincides with the first signs of the international financial crisis as repayment rates of sub prime mortgages in the US started to deteriorate substantially and concerns about investments in the developed financial system started to emerge. However, even after the financial crisis surfaced openly in developed financial markets in August 2007, capital flow continued to pour into Brazil. More concretely, while there was a net inflow of portfolio investment of US\$33 bn between the first quarter of 2006 and the second quarter of 2007, the country received US\$41 bn after the third quarter of 2007 up to the third quarter of 2008 when the crisis finally hit Brazil.

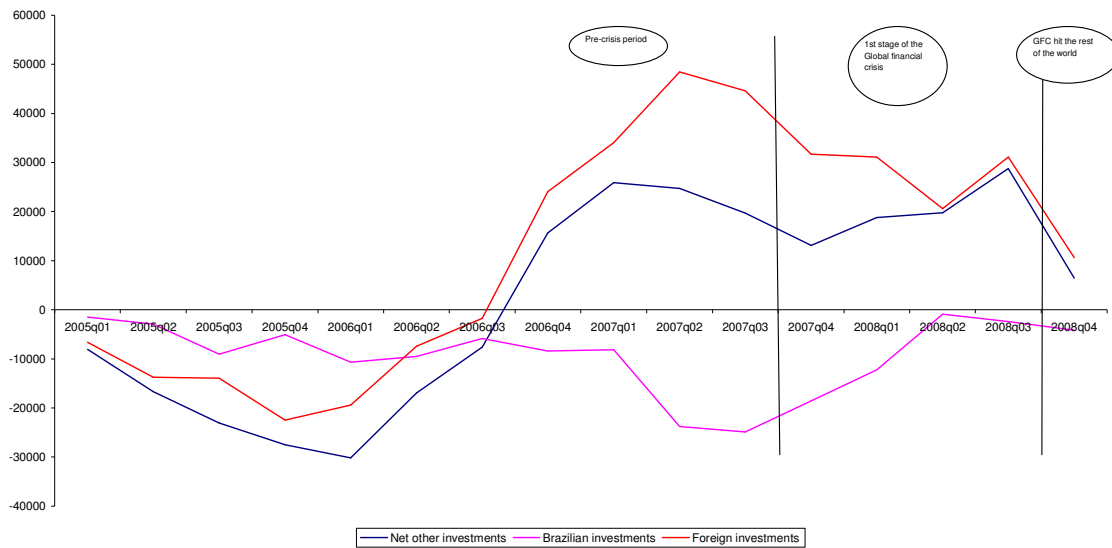


Source: BCB 2009.

Graph 3 shows the behaviour of other investments, which are basically banking flows, over a similar period.

⁵ Net portfolio flows are essentially driven by foreign investment as Brazilian portfolio investment abroad is still relatively low (in contrast to Brazilian foreign direct investment and banking flows which have shown a substantial increase over recent years as part of the internationalisation process of the Brazilian economy).

**Graph 3: Other Investments
(\$ millions)**



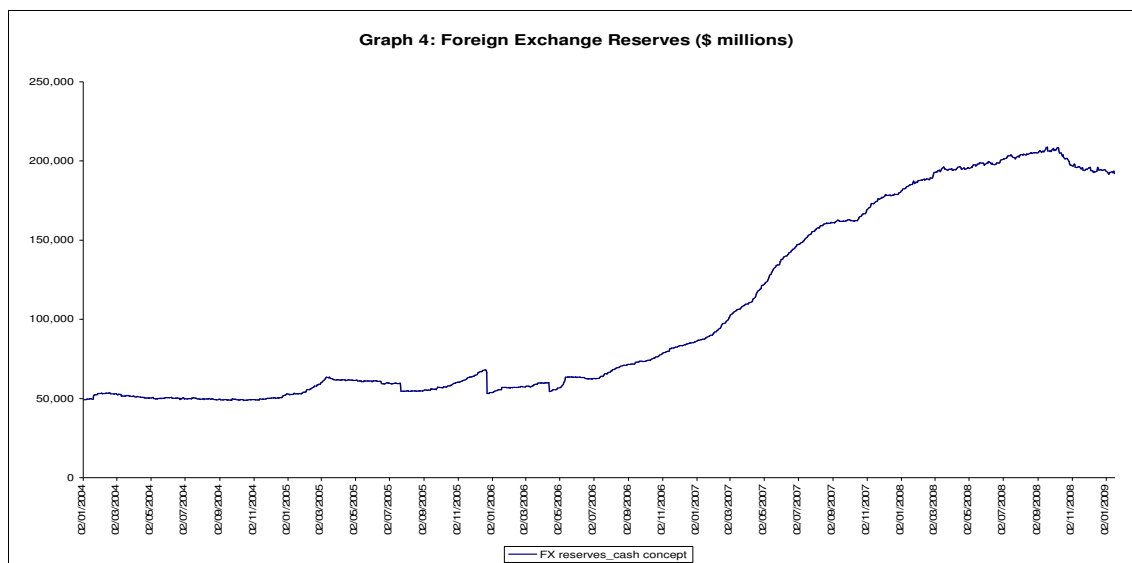
Source: BCB 2009.

Banking flows were negatively affected by the Brazilian payment to the IMF in 2005. As a result, net flows showed a negative flow of US\$28 bn in 2005. For the pre-crisis periods, from the first quarter of 2006 to the second quarter of 2007, two points are worth highlighting: first, there was a huge foreign banking flow of approximately US\$ 55bn to the country. Second, Brazilian banking investment abroad also showed a huge flow of US\$28 bn up to the summer of 2007.⁶ More interesting for this paper, however, is the behaviour of banking flows since the outbreak of the global financial crisis in August 2007. In line with the behaviour of other foreign short-term capital flows, banking flows to Brazil – which are registered as short-term investment in the balance of payments – started to pick up again as the crisis struck in the developed financial system.

As can be seen from Graph 4 the most distinct aspect of the capital flow dynamics outlined above is a huge increase of international reserves after the outbreak of the global crisis in August 2007 until the crisis finally hit Brazil a year later in September 2008. As a result of active intervention by the central bank in the foreign exchange market – a phenomenon which will be discussed more in detail in Section 4 of this paper - the stock of international reserves increased by US\$120 bn to a peak of more than US200 billion during the period. At the same time the accumulated balance in the current account showed a deficit of US\$18 bn⁷.

⁶ In our opinion, those banking investments are not linked to arbitrage operations which are common in financial systems with large foreign participation but can be related to an attempt of internationalisation of the Brazilian banking system which came to an end in the summer 2007. This attempt can be inferred from the increase of foreign assets in the commercial banks' balance sheets from US\$27 bn to US\$ 39 bn in the first half of 2007. It is important to say that the other investments account includes capital flows through the banking system. So it can be argued that the observed increase in banks' balance sheets in 2007 reflected an investment flow made on behalf of the banks (see IMF IFS statistics). For an example of arbitrage operations see Kyungsoo Kim et alii (2009) on South Korea.

⁷ Interestingly, on a quarterly basis the current account turned in the last quarter of 2007, mainly as a result of rising income and profit remittances. This phenomenon is in line with the speculative nature of foreign direct investment mentioned in an earlier footnote.



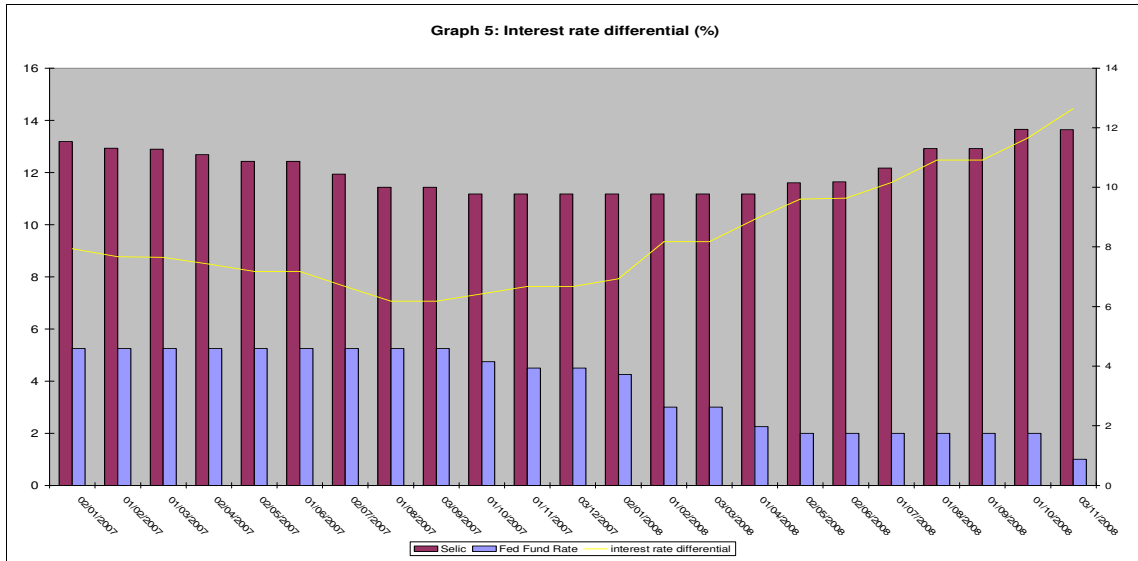
Source: BCB 2009.

This paper therefore argues that the exchange reserves accumulated during the final years before the crisis are essentially “borrowed” reserves, resulting from short-term financial operations of the capital account rather than current account transactions. During the beginning of 2007 – when the first signs of the international crisis emerged – and September 2008 – when it finally hit Brazil - the stock of short-term external debt increased from US\$20 bn to US\$48 bn. At the same time, the accumulated portfolio investment flows to equities and debt securities reached US\$72 bn while the accumulated banking flows were US\$48 bn. This large stock of foreign investment in the country, however, had important implications for crisis dynamics as will be shown in Section 3.

Above paragraphs have illustrated that while the developed financial system was already strongly affected by the international financial crisis, previous capital flow trends to Brazil (and indeed to other emerging markets with similar characteristics) were further reinforced during the first stage of the crisis. This differential dynamics between developed and developing financial markets during the global financial crisis reflects the logic of international capital flows and the position of emerging countries in the global financial system. Falling profitability in developed financial markets – as prices of financial assets started to decline and the Federal Reserve decided to lower its main policy rate to deal with the effects of the crisis – lead to a hunt for “yield” around the globe, mainly into emerging countries with high real interest rates and sound fundamentals⁸.

Graph 5 shows the interest differential between the Federal funds rate and the Selic, Brazil’s overnight rate, which – after a continued decline beforehand – started to rise again in August 2007-exactly when the international financial crisis struck.

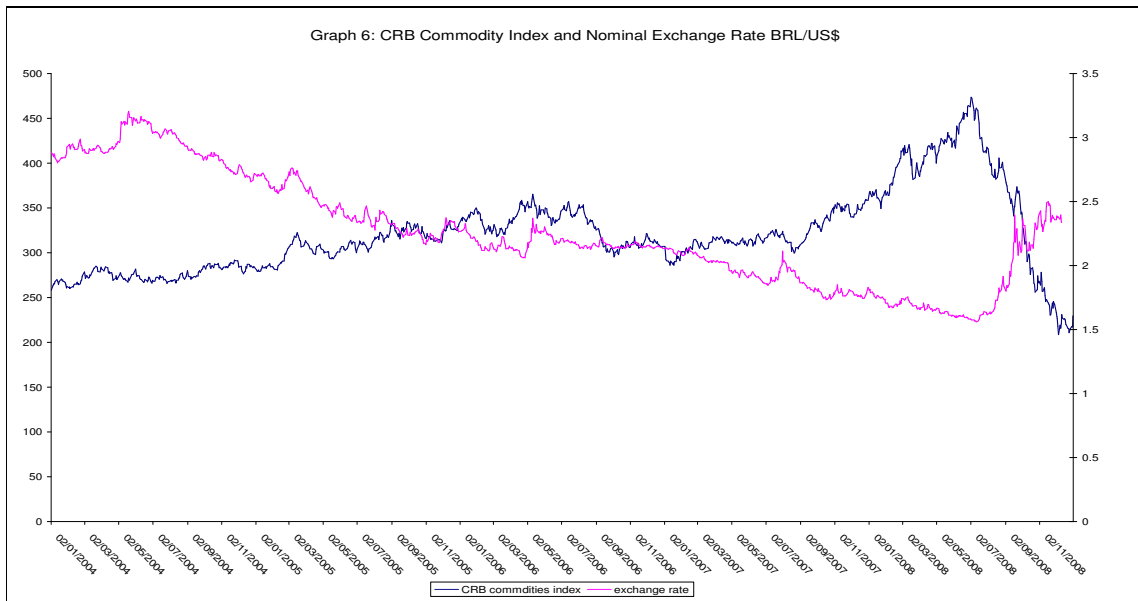
⁸ The falling profitability in developed financial markets started with the increasing problems in the US housing market (and all markets related to it) and the falls in mature equity markets.



Source: BCB 2009b.

Interest rate developments in the US – with the US\$ being the main funding currency of international investments – were reinforced by the Brazilian central bank’s monetary policy decisions. In the midst of the financial crisis inflation concerns due to continuous high commodity prices prompted the central bank to further hike domestic policy rates. However, while this had little effect on commodity prices - which are determined in international markets – it gave further impetus to foreign capital inflows, especially in fixed income instruments.

Returns in the Brazilian financial market were not only shaped by interest rate characteristic. Continuous exchange rate appreciation contributed substantially to capital gains on domestic assets.



Sources: BCB 2009 and Bloomberg.

Indeed speculation on future currency appreciation was one of the main carry trade operations in the Brazilian financial market before the outbreak of the financial crisis⁹. As can be seen from graph 6 the exchange rate continued to appreciate strongly after August 2007 thus allowing continued capital gains in domestic currency, especially in the stock market. This in turn created a situation of self-fulfilling expectations as continuing capital inflows and foreign exchange flows further supported the exchange rate appreciation. Another sign of continuing exchange rate appreciation and thus capital gains in domestic currency were the ongoing rise in commodity prices which had become tightly linked to developments in the Brazilian real¹⁰.

Thus in sum, this section has argued that as a result of falling yields in developed financial markets in the beginning of the global crisis and continuing attractive conditions in emerging markets, international capital flows showed a final surge to this asset class before the climax of the crisis in September 2008. These flows, however, assumed an increasingly short-term nature as investors' demand for liquidity rose in the financial crisis. This liquidity was provided by Brazilian financial assets, fundamentally supported by the operations of the central bank.

2- The Build up of Vulnerabilities

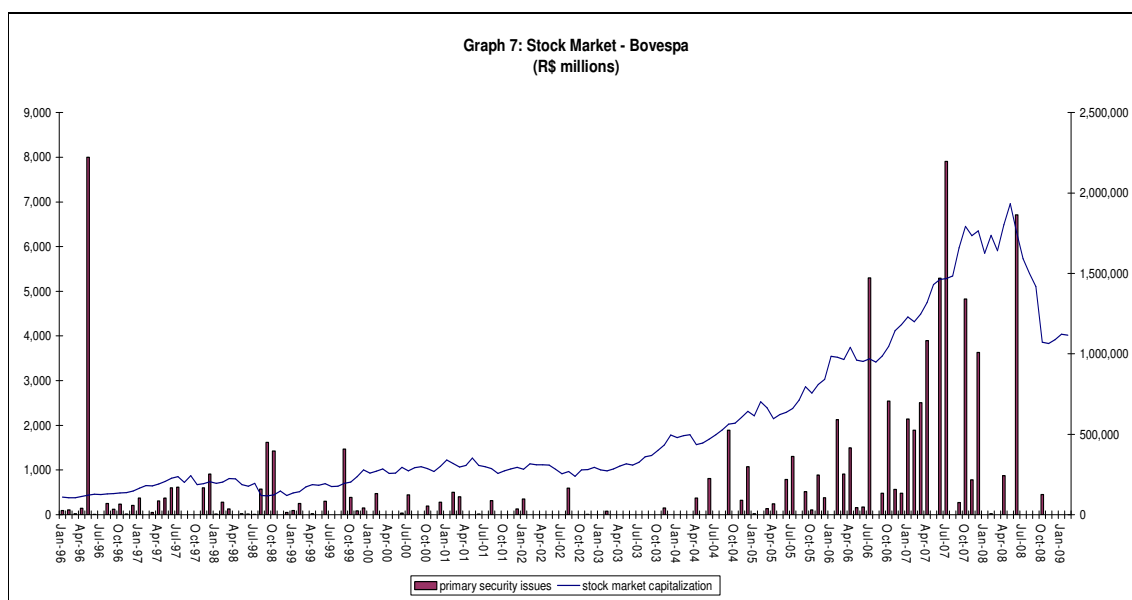
In line with the dialectic relationship of capital flows postulated in this paper, the above outlined surge in capital flows led to the build-up of vulnerabilities in the Brazilian financial system, which contributed to the substantial depreciation of the Brazilian real during the international financial crisis. Thus, although less obvious than in the case of currency mismatches as experienced in Eastern European countries, Brazil's increased exposure to short-term foreign capital and its liquidity with regards to such operations are crucial to understand how the international financial crisis affected the Brazilian economy, causing one of the largest exchange rate depreciations experienced among emerging markets.

Although the focus of this paper is on the crisis process itself, it is important to mention that the increased liquidity of Brazil's financial assets not only contributed to the "overshoot" in the financial crisis, but also found its counterpart in the sustained exchange rate appreciation before the crisis. Despite substantial intervention by the central bank, the currency appreciated from nearly R\$ 3.1 in the middle of 2004 to close to R\$ 1.5 to the US dollar in August 2008. The strong exchange rate, in combination with increasing profit and remittances from prior foreign investment, resulted in a widening current account deficit, as shown above. However, this paper argues that it was not this deterioration of "fundamentals", but the large exposure of foreign investors to short-term Brazilian assets and the liquidity of these assets which caused the run on the currency.

⁹ While the large exposure to Brazilian assets in foreign investors' portfolios and the liquidity of these assets were the main driver of crisis dynamics, the exposure of domestic companies, mainly exporters, to exchange rate derivatives betting on the continued exchange rate appreciation were an important contributor to the large exchange rate depreciation. This speculative behaviour can be seen in the increasing difference between exporters' financial balance and their foreign on board value (FOB), which passed from around US\$11 bn to US\$23 bn over the period. This difference is the result of advances on export contracts and payment in advance for exporters by banks.

¹⁰ The relationship between Brazil's exchange rate and commodity prices is complex and circular. On the one hand, commodities and emerging market currencies are objects of the same investor class, aiming for high risk and high return assets (for the role of speculation for commodity prices see Newman, 2009). On the other hand higher commodity prices directly affect external balances of several emerging countries further tightening this link between the two asset classes. As can be seen in Graph 6 commodities turned in July, which was nearly at the same time as the Brazilian real.

The first manifestation of Brazil's increased external vulnerability was the rising stock of foreign investment in the domestic stock market. Graph 7 shows the substantial rise in primary security issues and stock market capitalization. Although parts of this were driven by domestic investors, the above outlined balance of payments flows testify to the increasing involvement of foreign investment in the Brazilian stock market. And indeed according to data of the local stock exchange (Bovespa) the foreign participation in Initial Public Offerings (IPOs) increased from 48% in 2005 to 76% in 2007. This increase in foreign participation was fuelled by the rising liquidity of the domestic secondary market which allowed active trading and quick portfolio adjustment and made Brazilian equities one of the most actively traded emerging market securities¹¹.

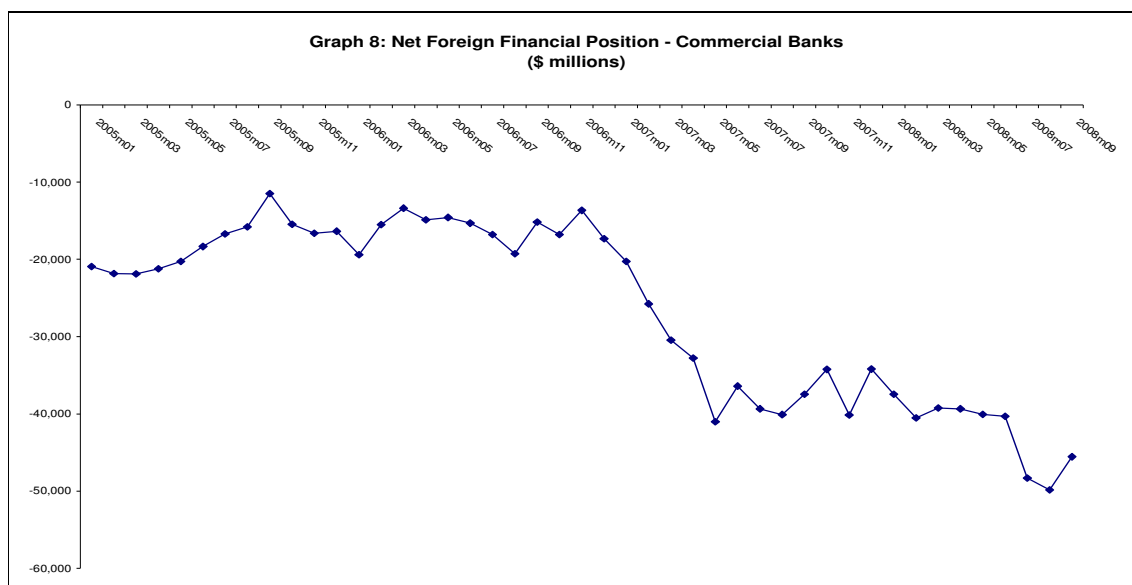


Source: BM&FBovespa

Although the theoretical literature points to the longer term character of equity compared to fixed income investment – as investors are interested in real returns of the companies through dividend payments – it will be shown below that equity investment did not act stabilizing in the crisis. Quite to the contrary, large parts of foreign investment in the domestic market were transferred abroad as the crisis struck. This is linked to the importance of exchange rate movements for stock market investment, which are an important part of capital gains for foreign investors. Thus stock market investment in Brazil was mainly driven by short-term carry trade operations to take advantage of favourable exchange rate developments. This however also implied that large parts of investment remained unhedged, which had important implications for exchange rate dynamics in the crisis as foreign investors tried to cover their positions. In this line, Hau and Rey (2004) argue that increased exposure to such type of capital flows can increase volatility of exchange rate movements. In addition BIS (2009:4) points out that stock market's players tend to be more leveraged, which can further contribute to exchange rate volatility in the times of crisis.

¹¹ Data by Emerging Market Portfolio Research (www.emergingmarketportfolio.com) shows that Brazilian equities had the largest proportion in global emerging market funds reaching nearly 15% of total assets in September 2008.

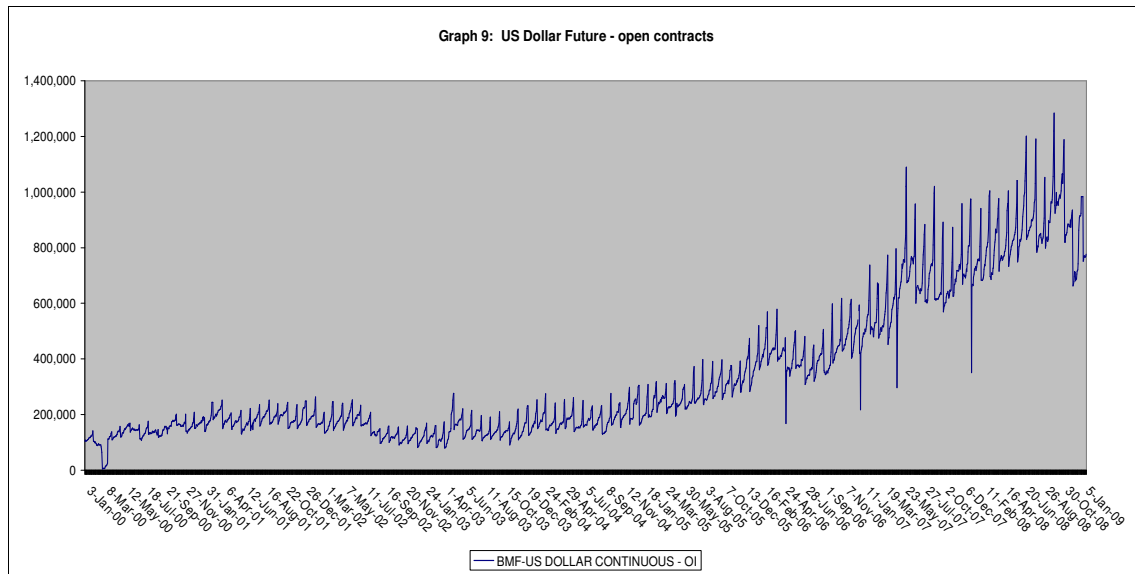
The second vulnerability created by international capital flows and the operations of the domestic financial system can be observed in Graph 8 through banks' net foreign position. This position is banks' foreign assets minus their foreign liabilities. As a counterpart to the surge in banking flows to Brazil stands a substantial increase in US\$ denominated liabilities of the domestic banking system¹². Although these liabilities were matched by liquid asset holdings, as will be discussed in more detail below, this short-term borrowing in international money markets substantially increased Brazilian banks' vulnerability to external market conditions. In addition, the resulting foreign currency exposure of domestic banks – as foreign currency funding was mainly invested in domestic assets to take advantage of high real returns – played an important role in their operations during the crisis, exacerbating exchange rate dynamics.



Source: IMF, *International Financial Statistics*.

The third manifestation of Brazil's new form of external vulnerability and probably the most peculiar one of the Brazilian case is the presence of a huge derivative market, both in relation to the underlying financial markets and the economy as a whole. According to the Financial Times (8th of June 2009), Brazil's derivative and stock exchange, the BMF&Bovespa, is already bigger by market value than the NYSE Euronext, Nasdaq OMX and the London Stock Exchange. Graph 9 shows the increase in open contracts in US\$ dollar futures. While hovering around 200,000 contracts in early 2000, this reached an average of 1,000,000 contracts before the outbreak of the crisis. The daily trading volume between May and June 2008 was around of R\$30 bn, reaching R\$41 bn during the crisis peak between September and October 2008.

¹² Based on the balance of payments statistics presented above it can be seen that this borrowing is primarily of short-term nature.



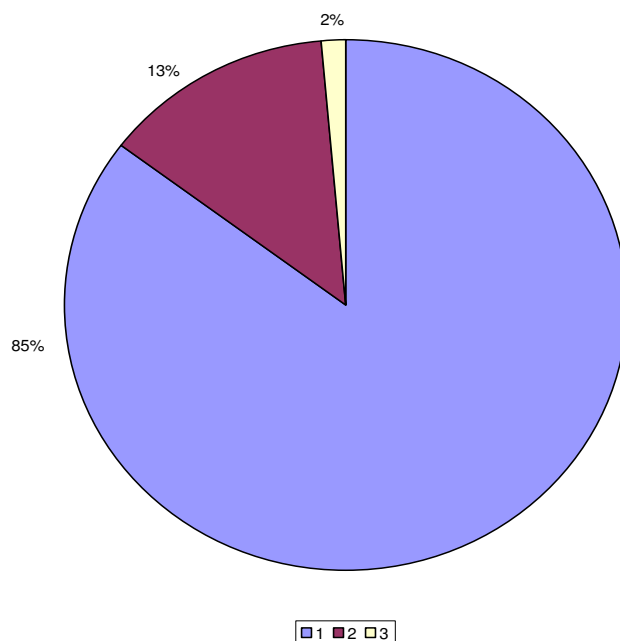
Source: BM&FBOVESPA.

This compares to a daily volume of operations of around R\$4,4 bn and R\$5,5 bn on the spot market for the same period. Thus contrary to what happens in the rest of the world the size and depth of Brazil's derivative market has by far surpassed that of its spot market (for consequences for price formation see Ventura, 2008). A similar phenomenon can be observed with interest linked derivative instruments. According to Costa et al. (2007) over the first half of 2006, average daily transaction volume in the DI futures market was six times that of the secondary market for fixed-rate government bonds¹³. Thus, although partly driven by increased hedging needs as a result of rising issue of real-denominated fixed rate government debt, interest related futures seem to have become a substitute for underlying fixed income instruments.

This partial substitution of trading with underlying assets by the futures market has been facilitated and supported by a heavy concentration in short-term maturities in the derivatives market. The bulk of trading volume in dollar futures are concentrated in the first maturity while most of the trading in the interest rate futures takes place in the maturity up to 1 year.

¹³ The DI rate is the average interest rate on overnight repurchase agreements that are collateralized by private securities and is compiled by the CETIP, a private clearing house.

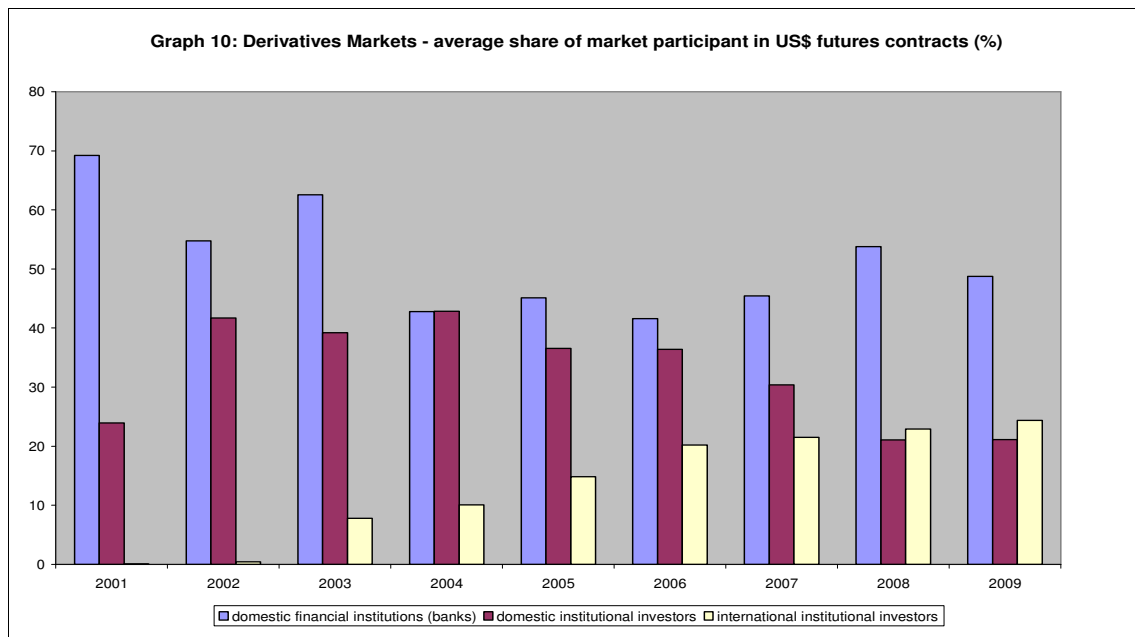
Trading Volume in US\$ Future Contracts in R\$ Millions (2007/2008)



Source: BCB (2009) *Bulletin Monthly Report*, chapter 3.

Thus, in line with the increasingly short-term nature of financial applications in the Brazilian market, this very deep derivatives market concentrated in short-term maturities has supplied domestic and foreign investors the possibility to trade high yielding Brazilian assets with the option of immediate exit. As a result, the share of international institutional investors in US\$ dollar futures increased from a minimal share in 2001/2002 to nearly 25% in the beginning of 2009¹⁴. The possibility to trade on the derivative market rather than the underlying cash market has fuelled the increased participation of foreign investors in the Brazilian market for several reasons: First, as pointed out by Saxena and Villar (2008) foreign exchange swaps are a cost-efficient way to fund financial market operations across jurisdictions. To keep a balance sheet in different jurisdictions that grants access to the money market/interbank market raises the cost of trading. Second, derivatives market allow for much higher leverage as the only immediate cash transactions involved are the deposits of margins at the exchange. Third, derivative markets may also create new arbitrage opportunities across local financial markets, encouraging new trading strategies among financial institutions (BIS, 2009: chapter E). Finally, remaining restrictions on operations in the cash market, especially in the case of operations in the foreign exchange spot market, has meant that foreign players have migrated to the derivatives market.

¹⁴ There is also a continuous increase in the foreign participation in DI futures contracts since 2002, which reached its peak of above 20% before the crisis hit Brazil in September 2008.

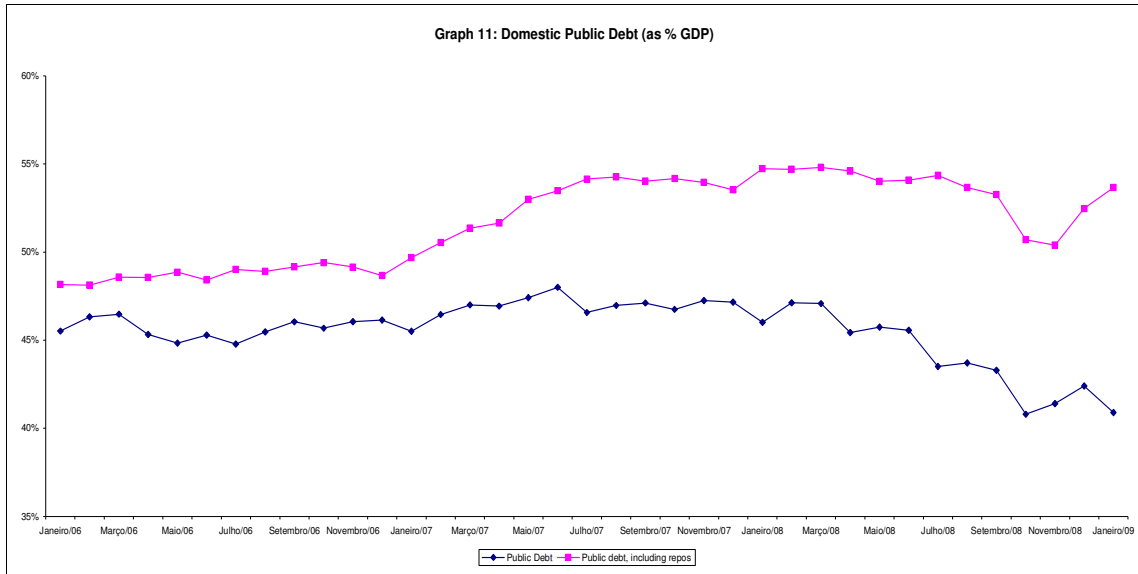


Source: BM&FBOVESPA.

Brazil's highly liquid derivative market concentrated on very short-term maturities with a strong – very often highly leveraged - foreign presence is probably the most obvious manifestation of Brazil's increased external vulnerability as any change in external conditions and resulting portfolio adjustment of foreign investors can lead to an immediate sell-off of Brazilian assets unrelated to domestic conditions. In addition, the high leverage of institutions operating on the derivatives market implies that the resulting exchange rate exposure and thus price adjustment in case of a (forced) deleveraging process will be much higher compared to exposure in the underlying asset.

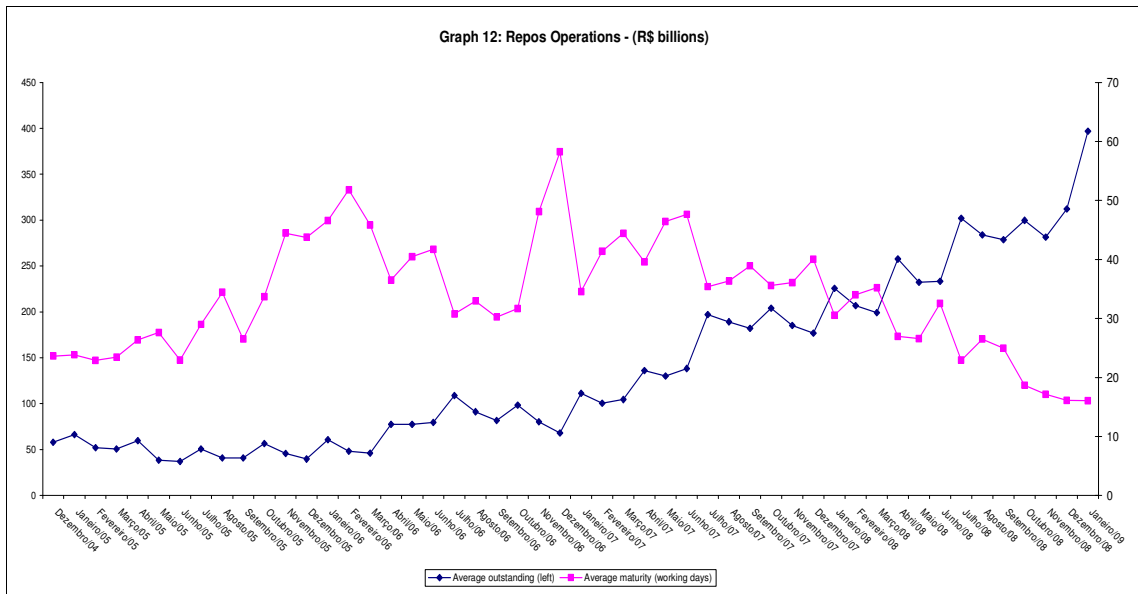
However, this paper would argue that the role of Brazil's highly liquid derivatives market in contributing to the country's external vulnerability goes even further than financial applications on the futures market itself: the possibility to hedge any foreign exchange exposure in other financial applications, mainly the stock and fixed income market, has acted as an additional support to foreign short-term capital flows to the Brazilian market and has thus contributed to the rising stock of foreign investment in the country. The possibility to hedge against exchange rate risk with little actual resources involved is an important factor in the time of capital inflow or "normal" times. However, it assumes special importance in the time of crisis when exchange rate depreciation materializes.

As outlined above, Brazil's increase in external vulnerability has not been unrelated to domestic conditions. More concretely, as can be seen from Graph 11, the rising exposure to very short term foreign capital movements found its structural counterpart in a surge in short-term internal public debt as a result of central bank monetary sterilization operations.



Source: BCB 2009a.

Although officially following an inflation targeting regime the Brazilian central bank has been an important operator in the foreign exchange market conducting sterilized intervention to avoid a rapid appreciation of the real in the face of strong capital inflows. To avoid monetary expansion as a result of its dollar purchases the central bank has sold an increasing number of Treasury bonds to the domestic financial system. Graph 12 shows the monthly average amount of outstanding repo operations and the average maturity (in working days) of these operations.



Source: BCB 2009a.

It can be seen that not only did the overall outstanding amount increase substantially, but there was also a marked fall in the average maturity of these securities. This in turn coincided with the beginning of the financial crisis in the developed world. In line with the dynamics of international capital flows, as uncertainty increased in international financial markets, so did

the demand for increasingly liquid financial assets on behalf of Brazilian banks. This demand for room of manoeuvre on behalf of domestic banks was especially important given the short-term nature of the stock of foreign investment in Brazilian assets which could lead to an immediate rise of demand for foreign currency by foreign investors. The short-term nature of their assets allowed Brazilian banks' to quickly convert domestic into foreign currency and meet the demand by foreign investors, which was especially important in the crisis. In other words, through the falling average maturity of repo operations offered by the central bank the short-term nature of international capital flows was transmitted into domestic financial assets, which in turn allowed the banks to further capture foreign resources as their maturity risk was falling.

Furthermore, the possibility of Brazilian banks to hold increasingly liquid assets was not matched by a fall in these assets' yield. Thus, domestic banks managed to increase their room for manoeuvre without having to take a loss on their profitability. As the maturity of Treasury bonds decreased, their interest rates became increasingly close to the domestic overnight rate, the Selic, which in turn was among the highest nominal interest rates in the world. More than that, as has been shown above, the interest rate differential between Brazilian and American rates widened during the crisis allowing for even higher returns.

3 – The Unfolding of the Global Crisis in Brazil

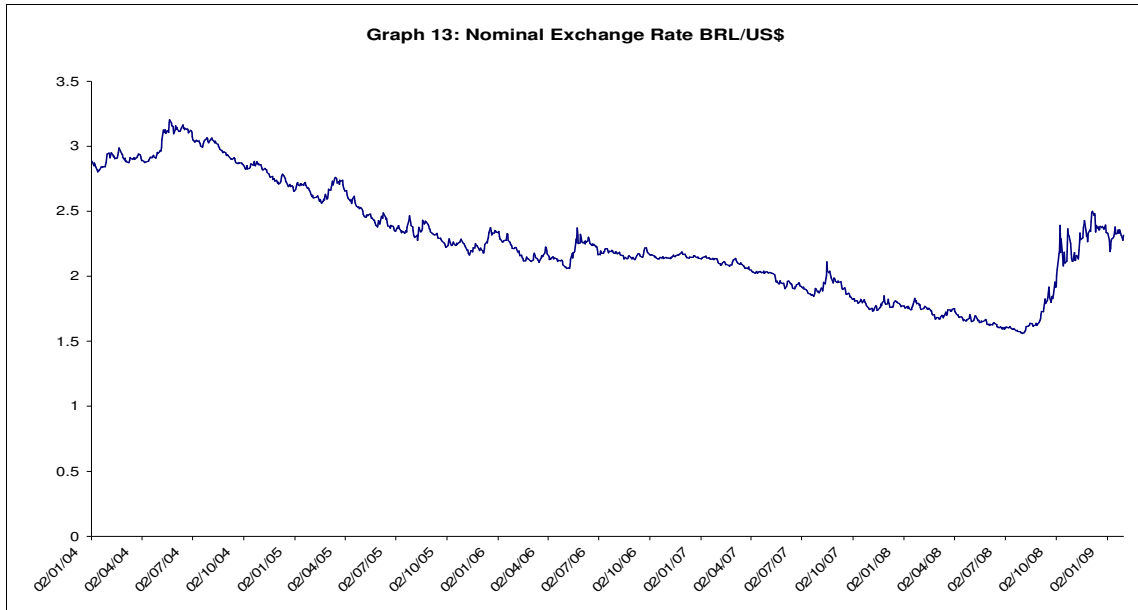
The increased liquidity of Brazil's financial assets and its integration in international financial markets has created a new form of external vulnerability – characterised by a large stock of short-term foreign investment in the country - which manifested itself in one of the largest exchange rate depreciations among emerging countries during the crisis. Despite good “Fundamentals” (see Table 1) – Brazil had become a net creditor and although turning the current account was still in a good shape – the Brazilian real depreciated by more than 60% during the crisis.

Table 1

	Box Fundamentals (as % GDP)					
	Dec-06	Jun-07	Dec-07	Mar-08	Jun-08	Sep-08
Current Account	1.3	0.8	0.1	-0.6	-1.0	-1.7
Fiscal Position (primary surplus)	3.3	3.6	3.5	3.9	3.9	4.1
Public sector net debt	45.9	45.0	43.9	42.6	41.8	40.0

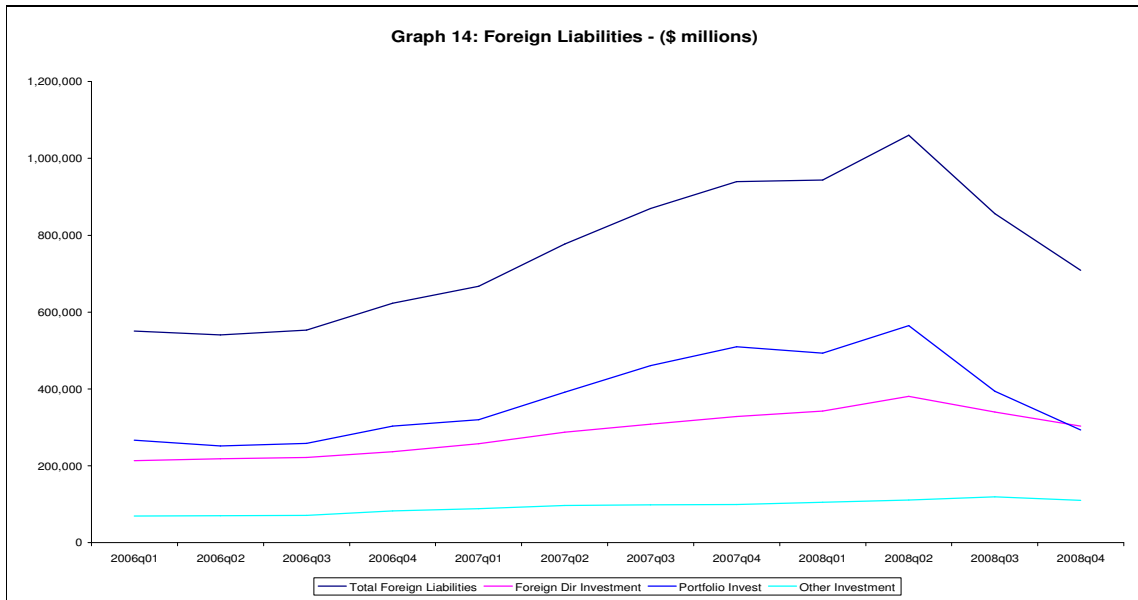
Source: ECB (2009)

As can be seen in Graph 13 after years of sustained appreciation the exchange rate turned in the first week of August 2008 and continued to depreciate thereafter.



Source: BCB 2009.

While high real returns had maintained capital flows to Brazil until then, increasing losses in developed financial markets and the need to adjust their portfolios induced foreign investors to sell off Brazilian assets. While this was a general process among emerging markets it was especially severe in the case of Brazil: First, the accumulated stock of foreign investment in the country was one of the highest. Second, the liquidity provided by the Brazilian market, especially the futures market, meant that the country's assets were among the first and with largest volume to be sold.

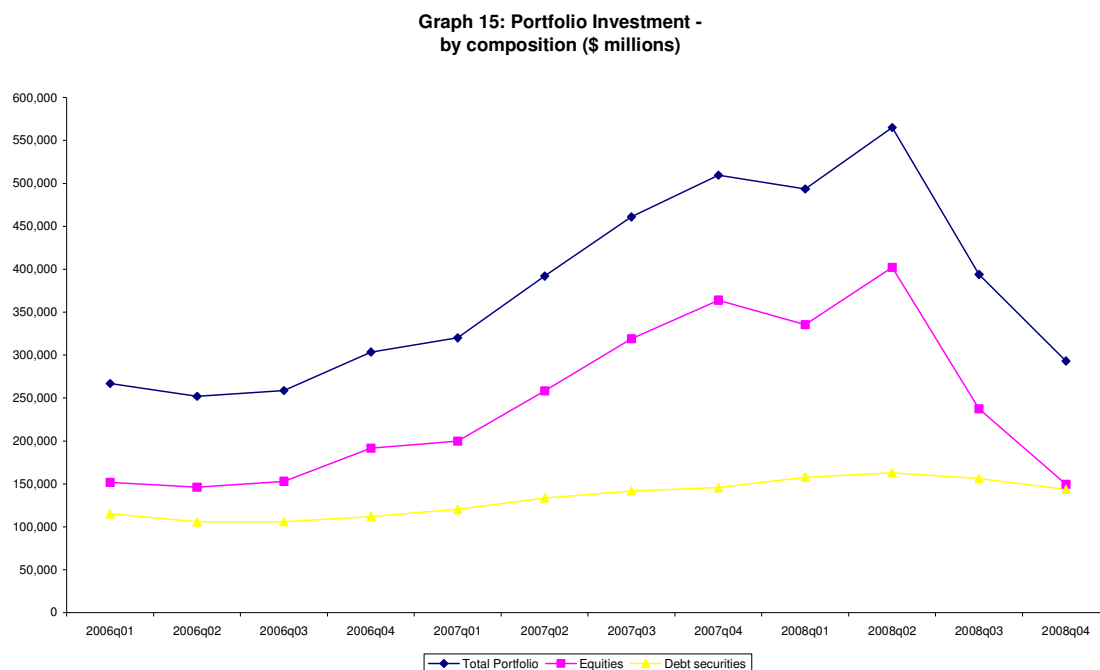


Source: IMF, *International Financial Statistics*.

Graph 14 shows Brazil's foreign liabilities from 2006 to 2008. In support of above presented balance of payments flow data it is evident that the stock of outstanding obligations to foreigners increased substantially in the beginning of 2007 and that portfolio flows played a driving role for this dynamic. At its peak in the middle of 2008, the total outstanding stock of foreign liabilities reached US\$1 trillion.

However, the graph also shows the sharp fall in the outstanding stock due to the global portfolio adjustment in September 2008, which caused a powerful capital flight through portfolio and banking investment accounts. In the last quarter of 2008 alone, capital flight through the financial account reached US\$22 bn.

Graph 16 shows the stock and dynamic of foreign investment in the Brazilian equity and debt market according to the IMF's international investment position.

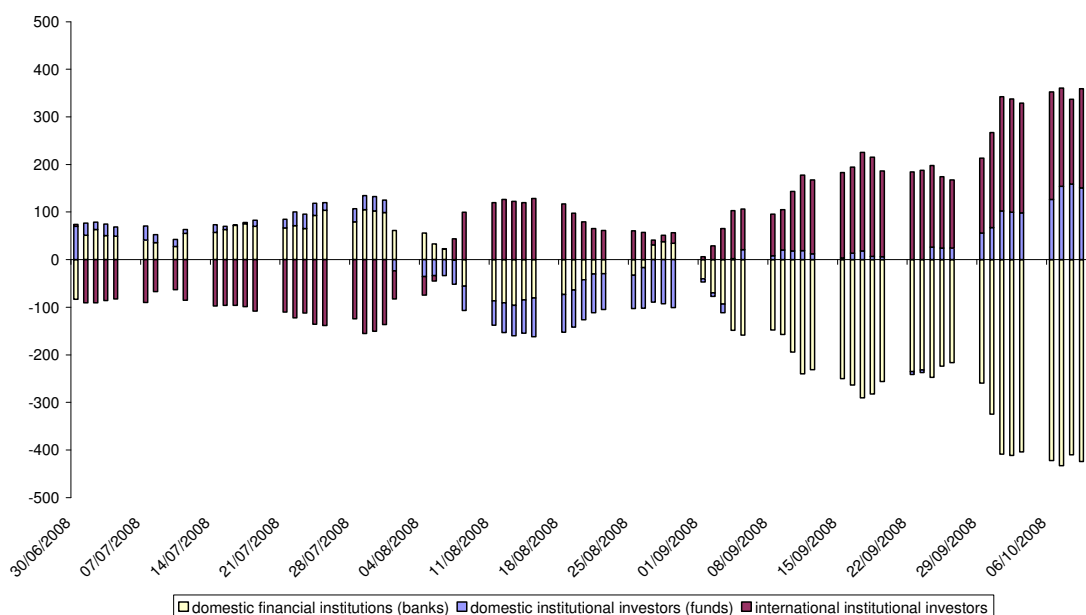


Source: IMF, *International Financial Statistics*.

While fixed income investment remained relatively stable over the crisis, flows to the stock market experienced a near total reversal with the outstanding stock falling back to its 2006 level. While partly the result of quantity adjustment this was also caused by a substantial adjustment in prices on the Brazilian stock market. Thus contrary to economic literature, stock market investment exhibited destabilising behaviour in the crisis and seems to have been driven by short-term speculative considerations rather than long-term investment purpose.

The driving role of foreign investors and the important role of Brazil's liquid futures market for exchange rate dynamics can be demonstrated by data on international institutional investors' net open interest in the first US\$ future. As can be seen in Graph 15 the change in the currency's tendency in August 2008 coincided exactly with the change of positions of foreign investors in the futures market.

Graph 16: Net Open Interest in Dollar Futures per Market Participant



Source: BM&FBOVESPA 2009.

Foreign investors had maintained short US\$ positions (negative sign) since the beginning of the sustained appreciation trend in the middle of 2004 and kept their positions all the way through the outbreak of the international crisis in August 2007. Although switching to long positions in times of increased market uncertainty, e.g. at the near failure of Bear Sterns, the tendency for short positions remained even during the first stage of the financial crisis. In the first week of August 2008, however, these investors assumed long US\$ positions, partly to hedge their exposure in domestic assets markets, partly to speculate against a future real depreciation.

The hypothesis that it was positions taken by foreign investors on Brazil's futures market which determined exchange rate dynamics in the times of crisis is further supported by actual foreign exchange flow data of the central bank¹⁵. According to this data the balance of commercial and financial foreign exchange transactions in August and September 2008 were positive (with a surplus of US\$ 1.9 and US\$ 2.8 bn respectively). Nevertheless, despite the inflow of foreign exchange during this period, the exchange rate started to depreciate at the same time as foreign investors changed their positions in the derivative market¹⁶.

This paper argues that it was not "economic fundamentals" but the portfolio adjustment by investors with positions in the Brazilian financial market which led to the acute exchange rate depreciation. This process started in the first week of August 2008 and became clearly visible with the failure of Lehman Brothers in September 2008.

¹⁵ One problem of these data is that they don't take into consideration off-shore operations, which have become increasingly important for Brazilian exchange rate dynamics. However, in a way this just further supports our argument as the exclusion of off-shore operations will lead to an underestimation of the importance of foreign institutions.

¹⁶ The positive foreign exchange balance in August and September 2008 was mainly due to continued strong trade balance. The balance of financial transactions had turned negative in April 2008. Increasing outflows on financial transactions, in turn, are reflected in banks' switch to short position in the US\$ futures market as they have to hedge their long positions in the spot market.

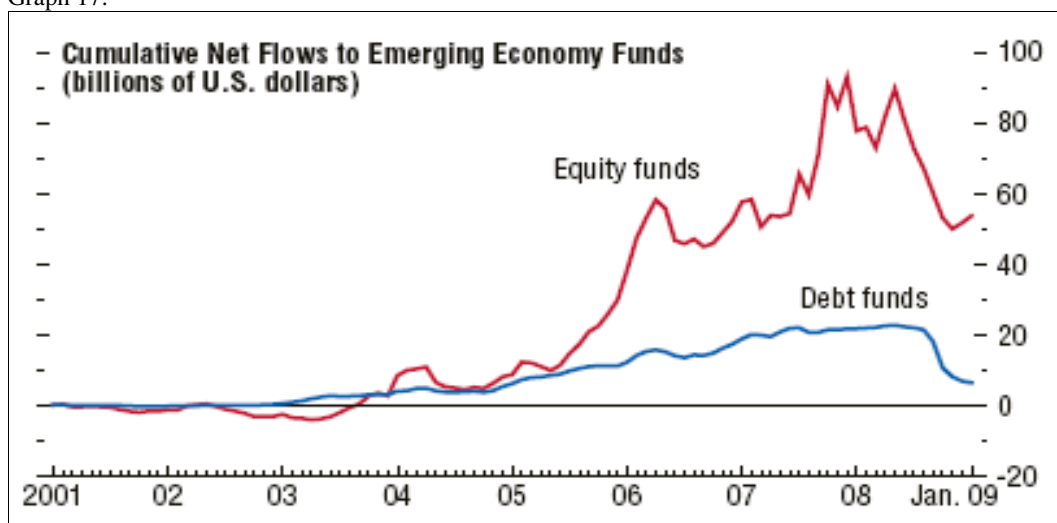
The role of portfolio adjustment for exchange rate dynamics can be captured by international banks' balance sheets. Table 2 shows the external position of banks to all sectors in the Brazilian economy. In line with the capital flow dynamics, the exposure of international banks to Brazilian assets continued to increase substantially after the global crisis had hit the developed world. However, in the last quarter of 2008 these positions dropped substantially as banks had to adjust their portfolios due to losses in international financial markets.

Assets	Dec-06	Dec-07	Sep-08	Dec-08
External positions of reporting banks to all sectors	105	157	176	155
External loans of reporting banks to all sectors	65	95	116	104

Source: BIS Quarterly Review, June 2009

Further evidence of this general deleveraging process is presented in Graph 17 which shows cumulative net flows to emerging economy funds for equity and bond market investment.

Graph 17:



Source: IMF; 2009: 113

Emerging Portfolio Fund Research

Again it can be observed that flows to emerging equity markets experienced a last surge in the first half of 2008 to then decline from around June 2008 onwards. Flows into debt markets were maintained even longer and started to decline around August 2008, at the same time the Brazilian real started to depreciate.

This general reduction in exposure to emerging market assets in the second half of 2008 is particularly evident in the behaviour of selected emerging market currencies. Graph 18 shows the Brazilian real, the Mexican peso, the Turkish lira and the Polish zloty since the beginning of 2003. Their general co-movement aside, it is impressive to note that all four currencies, from three different emerging market regions, experienced their turning point around the first week of August. Although similar financial market and macroeconomic characteristics might

have contributed to this dynamic, this highly synchronized movement supports our hypothesis of international portfolio adjustment as main driving factor of exchange rate movements¹⁷.

Graph 18: Emerging Countries Currencies



Source: Bloomberg.

The final trigger why emerging markets finally turned in August 2008 are difficult to pin down and in line with Minsky's writing are not considered essential for the core of the analysis. Given the general leverage of the system and overexposure to this asset class by international investors any small trigger could have led to this final adjustment. Indeed, international financial conditions deteriorated further in July 2008 as a result of the bankruptcy of the state sponsored Fannie Mae and Freddie Mac. These companies were the largest mortgages companies in the US housing market, being issuers of hundred of US\$ billions mortgages securities. One could argue that these institutions' bankruptcies acted like a signal to markets participants that the extent of the system's leverage had reached a limit. As a result commodity prices started to decline which, given the interdependence of commodity prices and emerging market assets, gave a further indication of deteriorating market conditions. This synchronised movement highlights the increased interdependence of financial markets and role of international portfolio adjustment for asset price dynamics.

In sum, the large exposure to short-term foreign capital flows and the increased liquidity of its assets has made Brazil increasingly vulnerable to conditions in international financial markets and portfolio decisions of global financial institutions whose operations can be entirely unrelated to economic conditions of the country. It is important to note that this argument is different from the normal contagion argument, in which fundamental problems of one emerging country spread over to another country with apparently sound fundamentals. In the portfolio channel advocated here, exchange rate behaviour becomes entirely de-linked from conditions in the country or emerging markets and merely a result of return considerations of

¹⁷ That having been said, there were distinct differences between different emerging market countries and capital flows did not show an entirely homogenous behaviour. The underlying factors and logic of capital flows will be analysed in a paper currently under preparation.

international banks and institutional investors. This also stresses the important difference in argument between traditional vulnerabilities to short-term capital flows and the new form of vulnerabilities presented in this paper. While capital flows, although of short-term nature, were traditionally thought as *investment* in emerging countries and thus driven by considerations about *domestic* conditions (justified or unjustified), recent integration in international financial market has made emerging market assets *trading* instruments, making portfolio decisions increasingly independent of domestic economic conditions.

However, as also pointed out in this paper, the increasing importance of short-term financial operations did not only manifest itself on the international level, but had also become increasingly engrained in the Brazilian domestic financial and even non-financial system itself. These structural characteristics of the Brazilian financial system contributed to the rise in foreign participation in Brazilian assets and are crucial to understand the cumulative effect on exchange rate dynamics.

As outlined in the previous section, the counterpart to the central bank's attempt to sterilize continuous capital inflows of an increasingly short-term nature was a substantial increase in short-term public debt held by the domestic financial sector (see also BIS, 2009 for this phenomenon). The ability to hold very liquid, high return carrying assets allowed banks to reduce their traditional maturity mismatch while at the same time maintaining profitability. This is important, because due to continuing regulations on the spot market and the cost of operating on the futures market, banks remain the main door to the Brazilian foreign exchange market and most of the operations of foreign investors are conducted through them. This, however, creates an implicit currency mismatch for banks which need to be able to honour foreign exchange demands by foreign investors at any time. This in turn is facilitated by the possibility to hold very short-term government assets and the disposition of the central bank to convert them in foreign exchange at any time. Thus, in addition to receiving relatively high returns on government securities, the short-term nature of these securities allowed banks a quick conversion into US\$ in the times of crisis, exacerbating pressures on the exchange rate¹⁸.

However, in the time of crisis banks not only had to acquire foreign exchange to honour their liabilities with foreign investors but as outlined above Brazilian banks had increasingly relied on short-term foreign funding to fund their investment and lending activities in the Brazilian market (BIS, 2009: 119). Although less prevalent than in other countries this exposed banks to an explicit currency risk and presented them with a serious roll-over problem as international funding costs increased¹⁹.

¹⁸ As will be discussed below these operations are very difficult to show empirically. This is partly so because data on bank assets are only monthly. However more importantly, the central bank's disposition to provide liquidity to the banking sector has meant that there was no drop in banks assets, but a change in structure of short-term government bonds to cash. This structural change however, is not observable in the data.

¹⁹ That having been said it is clear that positions by domestic banks were also of speculative nature. However, given their important role as financial intermediaries and operations for clients it is much more difficult to separate their function as hedger and speculator. In addition, it is important to note that Brazilian banks faced acute demand for foreign currency by another player in the Brazilian market: domestic companies. As mentioned above, the importance of short-term financial transactions was not only prevalent in the financial market, but had also reached the non-financial sector of the economy. Large Brazilian companies, mainly exporters, had assumed substantial positions in the derivative market betting on a continued currency appreciation which left them scrambling for cash as the exchange rate turned.

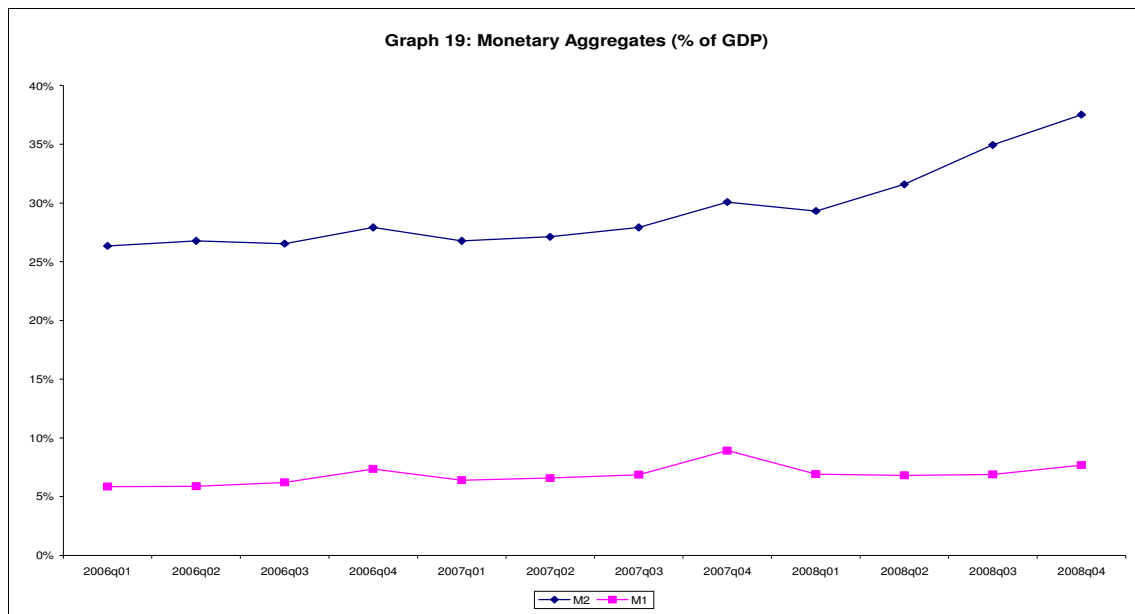
4 – The Role of the Central Bank

Brazil's increased external vulnerability created through a large and liquid stock of foreign investment in the country was crucially influenced by the operations of the central bank, which shaped the liquidity conditions in the domestic financial system in response and in interaction with foreign capital flows. In essence, it is argued that the central bank through acting as counterpart to above outlined short-term financial transactions and by providing liquidity to the financial system – both before and during the crisis – decisively shaped the process of increased external vulnerability of the Brazilian economy.

Since 1999 the central bank of Brazil has officially been operating under an inflation targeting regime. In this institutional arrangement monetary policy is primarily directed to keep the current inflation within a pre-announced band. To do so, the interest rate functions as the main policy instrument, whereas the exchange rate should only enter in the central bank's objective function if its dynamic adversely affects the inflation target. Thus, central bank intervention in the foreign exchange market should only be directed at containing exchange rate depreciation. However, as has been mentioned above and will be discussed in more detail below, the central bank has been a key operator in the foreign exchange market to avoid excessive exchange rate appreciation in the face of strong capital inflows. The success of this intervention, however, has become severely limited in the face of increased integration in international financial markets. More than that, it is argued that through its intervention in the three main financial markets – the money, the foreign exchange and the derivative market - the central bank has significantly contributed to the build up of Brazil's external vulnerability²⁰.

As was discussed above, as a counterpart to the surge in short-term capital flows to Brazil in the first stage of the crisis stood a rising stock of very short-term assets in the form of repos in the domestic financial system, which were issued by the central bank to sterilize the monetary expansion of foreign exchange purchases. Monetary sterilization becomes especially important in inflation targeting regimes given the increased institutional commitment to inflation control. However, while these monetary sterilization operations avoid the expansion of M1 (currency outside banks plus demand deposits), they have no effect on broad monetary aggregates such as M2, which includes banks' liabilities (basically time deposits and banking securities). This differential development between M1 and M2 can be observed in graph 19.

²⁰ The central bank's interventions in the foreign exchange spot market are not discussed in details in this paper as they are closely linked with the monetary sterilization operations.



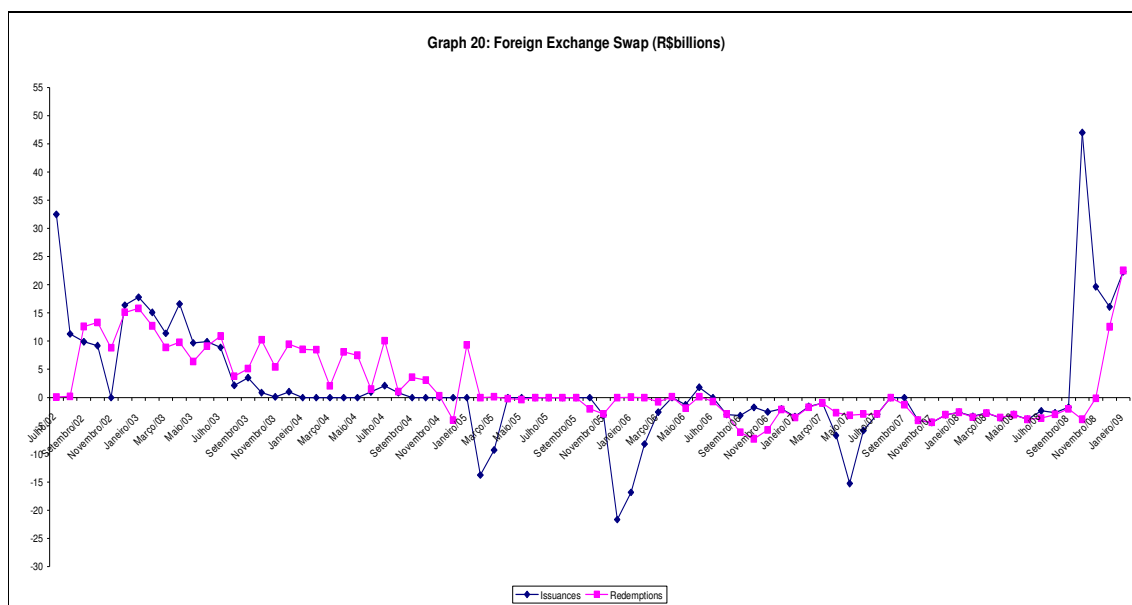
Source: BCB 2009c.

The increasing stock of very liquid assets on bank's balance sheets allows banks to expand their liability side and take advantage of favourable international conditions by capturing an increasing amount of resources from abroad. This is directly reflected in the increase in short-term foreign liabilities of domestic banks as discussed in graph 8. In addition, this has indirectly contributed to the increase in short-term foreign capital in the economy as it allows banks to quickly meet foreign exchange demands by foreign investors.

Moreover, the central bank has been intervening in the derivatives markets through foreign exchange (FX) swap operations to avoid a too rapid appreciation of the real. The FX swap is a financial derivative through which one agent takes an active position in interest rate and a passive position in foreign currency plus internal dollar yield rate and the other one takes an inverted position in both assets. Graph 18 shows the central bank's intervention through this instrument. Positive values imply the issuance of FX swaps contracts in which the central bank is assuming short positions in US dollar. Negative values mean issuance and redemption of reverse FX swap contracts in which the central bank is taking long positions in US dollar. In simple terms, while the reverse FX swap aims at buffering excessive appreciation, the FX swap – through assuming a future short position in US dollar – tries to avoid excessive exchange rate depreciation. Both instruments are subject to daily adjustments. It is also important to mention that the FX swap operations are one-sided operations where the market takes the one side and the central bank the other side.

In relation to the capital flow dynamics discussed previously, this intervention has shown a pro-cyclical character as the central bank has taken long positions in FX in the period of large capital inflows – experienced between the end of 2006 and September 2008 - and short positions in FX in the presence of capital flight as was observed in the last quarter of 2008. However, through intervening in the derivatives market through its FX swap operations in the time of exchange rate appreciation the central bank has contributed substantially to the increase in trading volume in the futures market.

As such, through acting as a counterpart to the foreign capital flows speculating on future exchange rate appreciation, the central bank has provided liquidity to the market and fuelled further capital inflows, which created the country's external vulnerability²¹.



Source: BCB 2009a.

However, the role of the central bank as main provider of liquidity to the markets became especially important when the global crisis hit the Brazilian economy in September 2008. In order to allow a more soft and rapid conversion of domestic currency into US\$ the monetary authority supplied a huge amount of foreign exchange and domestic currency to the market. The liquidity provision in foreign exchange consisted of FX spot sales, repos operations and trade finance loans. As a result, in January 2009 the total stock of foreign exchange liquidity supplied since September 2008 reached a level of US\$26 bn²².

To provide liquidity in domestic currency, the central bank mainly lowered its reserve requirements, concentrating on demand deposits and saving deposits. The amount of liquidity thus injected in the domestic financial system was around R\$ 99 bn up to January 2009. Further domestic liquidity was provided to the banks through the central bank's repo operations, which further increased the banks' flexibility to meet the demand for foreign currency in crisis time. As a result in the last quarter of 2008, the stock of repos remained quite stable around R\$290 bn. In the beginning of 2009, as the capital flight in Brazil eased, the total stock of repos outstanding reached R\$ 380 bn, which shows the importance of these operations for the dynamic of Brazil's financial markets.

Finally, the central bank also intervened in the derivatives markets through foreign exchange swap contracts. In contrast to spot interventions, FX swaps do not deplete international reserves as they involve an agreement of foreign currency sale by the central bank at some future data. During the crisis, the central bank changed its foreign exchange exposure from

²¹ According to BIS (2009: 75), "as position-taking in derivatives markets is generally cheaper than in spot markets, a market perception that exchange rate intervention leads to a deviation of actual from equilibrium exchange rates may trigger more forceful speculative activity than would otherwise be the case."

²² Of this US\$13 bn, US\$7 bn and US\$6 bn were of spot sales, repos and trade loans respectively.

long to short position in US\$ dollar. As a result its exposure in domestic federal debt and swap contacts passed from US\$15 bn (long) in September 2008 to US\$18 bn (short) in December 2008²³.

In conclusion, through its operations in the crisis the central bank did not only provide liquidity to the market, but also reinforced the short-term nature of financial positions and thus the domestic vulnerability discussed in this paper. Similarly to its operations before the crisis, the central bank provided very short-term securities in the form of repo operations (many of them with overnight maturity) to the market which provided it with an increased room of manoeuvre during the crisis. In addition, the central bank's actions in the derivatives market also reinforced the short-termism of the financial assets. As a result in January 2009 84% of outstanding foreign exchange swaps were of a maturity of maximum 2 months.

5 - Conclusion

This paper has argued that the effect of the international financial crisis on Brazil's economy shows that the country has been subject to a new form of external vulnerability. This manifested itself in one of the largest exchange rate depreciations among emerging markets. Despite sound "fundamentals" the Brazilian real depreciated by more than 60% during the crisis.

In contrast to traditional forms of external vulnerability, which focus on external debt, in the present case the main causes of vulnerability were Brazil's large exposure to short-term foreign capital and the increased liquidity (defined as the ability to meet outstanding obligations) of its financial assets. In the context of an open economy these are mainly funded in US\$, which makes the nominal exchange rate the focal point of analysis.

The liquidity provided by Brazil's financial assets has made them a standard portfolio investment for international investors. As a result, losses suffered by these investors in other markets forced them to liquidate their investments in the Brazilian market irrespective of domestic conditions. Hence, portfolio adjustments of globally operating financial institutions have become the prime cause of exchange rate movements. However, in line with the dialectic relationship of capital flows postulated in this paper exchange rate developments do not become entirely independent of domestic economic condition, as the larger the stock of short-term foreign capital in the economy, the greater the effect of portfolio adjustment on exchange rate dynamics will be. Thus, rather than traditional economic "fundamentals", the stock of foreign investment in the country becomes a main driver of exchange rate dynamics. The rising role of portfolio considerations and the dialectic relationship of capital flows, however, imply the near total loss of control over exchange rate dynamics as even countries with good economic "fundamentals" can experience large and excessive exchange rate movements.

The paper has further argued that the increased liquidity of Brazilian financial assets, and the resulting increase of their use in global investment portfolios, is directly connected to central bank operations. In an attempt to smooth excessive exchange rate movements, the central bank has actively operated in the main financial markets. As a consequence, it has acted as a main provider of liquidity in the markets, which supported the demand for Brazilian assets and decisively shaped the vulnerabilities of the Brazilian economy described in this paper. However, in the face of increased integration in international financial markets, the

²³ See BCB (2009a: table 10).

effectiveness of these attempts to smooth excessive exchange rate movements have become severely limited, because central bank operations in fact reinforced capital movements. As such, attempts to influence exchange rate developments may actually contribute to creating new forms of external vulnerability, which themselves become the main drivers of exchange rate dynamics.

The new form of external vulnerability highlighted in this paper is a direct result of Brazil's increased integration in international financial markets. The increased determination of exchange rate dynamics by international financial markets, and the reduced capacity of the central bank to influence such dynamics, have important implications for developing and emerging countries. This is because the exchange rate is an important relative price for such countries and can play an important role as a development instrument.

References:

- BIS (2009), Capital Flows and Emerging markets, *CGFS papers* n.33, Basle.
- _____(2009a), Statistical Annex, *BIS Quarterly Review*, Basle.
- Brazilian Central Bank (2009), Balance of payments, *Temporal Series*, March: Brasilia.
- _____(2009a), *Open Market Press Release*, January: Brasilia.
- _____(2009b), *Economic Indicators*, Brasilia.
- _____(2009c), *Monetary Policy and Financial System Credit Operations Press Release*, March, Brasilia.
- Costa, D. E. C., Nespoli, M. and Robitaille, P. (2007) Brazilian Interest Rate Futures: Evolution and Forecast Performance Draft Central Bank of Brazil and Board of Governors of the Federal Reserve System.
- Chang, R. and Velasco, A. (1998) Financial Crises in Emerging Markets: A Canonical Model. *Federal Reserve Bank of Atlanta, Working Paper* 10.
- Diamond, D. and Dybvig, P. (1983) Bank Runs, Deposit Insurance, and Liquidity. *Journal of Political Economy*, 91, 401-419
- Epstein G. (2005), "Introduction: Financialisation and the World Economy", in *Financialisation and World Economy*, edited by Gerald Epstein, Edward Elgar Publishing.
- Financial Times: *BM&FBovespa challenges global exchanges*, (<http://www.ft.com/cms/s/0/4ccb412c-544b-11de-a58d-00144feabdc0.html>) 8th June 2009.
- IMF (2009) *World Economic Outlook* April, Washington.
- _____
International Financial Statistics, Washington.

Keynes, J.M. (1964), *The General Theory of Employment, Interest and Money*, New York: Harcourt, Brace, Jovanovich.

Kyungsoo Kim, Byoung-Ki Kim and Young Kyung Suh (2009), Opening to Capital Flows and Implications from Korea, *Institute for Monetary and Economic Research*, Bank of Korea, working paper n.363, Seoul.

Lapavitsas, C. (2009), Financialised Capitalism: Crisis and Financial Expropriation, *Historical Materialism*, Volume 17, n. 2, pp. 114-148, Brill, London.

Minsky, H. P. (1975). *John Maynard Keynes*, Columbia University Press, New York.

Newman, S.A. (2009). The New Price Makers: An Investigation into the Impact of Financial Investment on Coffee Price Behavior. *NCCR-Trade Working Paper 2009/7*, Swiss National Centre of Competence in Research, Berne.

Painceira, J. P. and Carcanholo, M. (2004), "A ortodoxia neocompanheira: vulnerabilidade externa, política econômica e determinação dos fluxos de capitais", *Anais do IX Conference of Political Economy of SEP*, Uberlândia. (in Portuguese)

Radelet, S., Sachs, J. D., Cooper, R. N. and Bosworth B. (1998) The East Asian Financial Crisis: Diagnosis, Remedies and Prospects. *Brookings Papers on Economic Activity*, 1998, 1-90.

Rodrik, D. and Velasco, A. (1999) Short-Term Capital Flows. *Paper prepared for the 1999 ABCDE Conference at the World Bank*.

Saxena, S. and Villar, A. (2008), Hedging instruments in emerging market economies, *Financial Globalisation and Emerging market capital flows*, BIS papers n.44, Basle.

Stockhammer, E. (2004) Financialisation and the slowdown of accumulation. *Cambridge Journal of Economics*, 28, 719-741.